



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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|--|--|---|-----------------------|
| Applicant's or agent's file reference DE9200020043 | FOR FURTHER ACTION | | See Form PCT/IPEA/416 |
| International application No. PCT/EP2004/050787 | International filing date (day/month/year) 13.05.2004 | Priority date (day/month/year) 26.06.2003 | |
| International Patent Classification (IPC) or national classification and IPC G06F17/60 | | | |
| Applicant INTERNATIONAL BUSINESS MACHINES CORPORATION | | | |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 6 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | | |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> | | | |
| Date of submission of the demand 11.01.2005 | | Date of completion of this report 16.09.2005 | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | | Authorized Officer Streit, S Telephone No. +31 70 340-8903  | |

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/050787

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-17 as originally filed

Claims, Numbers

1-15 received on 31.08.2005 with letter of 26.08.2005

Drawings, Sheets

1/7-7/7 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/050787

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-15 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 1-15 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-15 |
| | No: Claims | |

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following document/s/:

- D1: PATRICK GOLDSACK, PETER TOFT: "SmartFrog - a framework for configuration" LARGE SCALE SYSTEM CONFIGURATION WORKSHOP, [Online] 8 November 2001 (2001-11-08), XP002295834 EDINBURGH Retrieved from the Internet: URL:<http://homepages.informatics.ed.ac.uk/group/lssconf/config2001/SmartFrog.pdf> [retrieved on 2001-09-10]
- D2: ANONYMOUS: "Web Services Outsourcing Manager" INTERNET ARTICLE, [Online] 30 September 2002 (2002-09-30), XP002295819 Retrieved from the Internet: URL:[http://www.alphaworks.ibm.com/tech/WSO M](http://www.alphaworks.ibm.com/tech/WSO%20M) [retrieved on 2004-09-10]
- D3: US-B1-6 304 892 (BHOJ PREETI N ET AL) 16 October 2001 (2001-10-16)
- D4: EILAM T ET AL: "Using a utility computing framework to develop utility systems" IBM SYSTEMS JOURNAL IBM USA, vol. 43, no. 1, 1 March 2004 (2004-03-01), pages 97-120, XP002295608 ISSN: 0018-8670

1. The amendments filed with the letter dated 26 August 2005 do not introduce subject-matter which extends beyond the content of the application as filed, and are therefore allowable under Article 34(2)(b) PCT.

2. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A method for describing configurations in a high level description language, the interpretation of said system description and its automatic instantiation on network resources (pages 2, 8, 14).

Implementation details like the use of a resource catalogue are disclosed as resource inventory (page 8) and by the use of configuration templates (page 19, 21). The resource management actions are disclosed as instantiate/terminate (page 11, 32) as part of the life cycle management.

2.1 The subject-matter of claim 1 differs from this known D1 in the use of a configuration

interpreter (page 8) instead of a compiler which transforms the information from resource and action catalogue into a machine readable executable and more importantly in that a service environment topology tree is automatically developed from a provider offering having no references to specific resources thereby following a particular algorithm.

2.2 The other documents D2-D3 do not anticipate the novelty of claim 1 since none of the prior-art document teaches the algorithm details of developing a provider offering into a service environment topology tree by the steps as claimed in claim 1.

2.3 The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

2.4 The problem to be solved by the present invention may be regarded as how to get a compiled description of a specific service environment topology which is usable by a resource management system from a provider offering having no references to specific resources.

2.5 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: None of the prior-art document teaches the algorithm details of developing a provider offering into a service environment topology tree by the steps of:

- using the provider offering as root node of the topology tree, adding identified resource types as nodes, adding child nodes if necessary and repeating the steps until the resource types cannot be mapped into lower resource types
- accessing a resource management action catalogue describing how to manage a single resource type by a resource control system, traversing the service environment topology tree, extracting from said resource management action catalogue all resource management actions of said resource types identified in said customer specific service environment resource topology tree,
- sequencing said extracted resource management actions according to requirements of said defined customer specific service environment, and compiling said sequenced management actions into a machine readable form executable by said resource management system.

2.6 Although individual process steps, i.e. tree generation, parsing of resource catalogues,

sequencing and compiling are standard in the field of computer science and well known to the person skilled in the art, the particular process flow and its application to this particular problem of how to get a compiled description of a specific service environment topology which is usable by a resource management system from a provider offering having no references to specific resources are not regarded obvious nor a straight forward combination of well known processing steps for the person skilled in the art.

2.7 Claims 2-7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3. The subject-matter of claims 8-14 - reciting a system for transforming a provider offering - is regarded as new and inventive for the same reasoning as already given for claims 1-7.

4. Claim 15 - a computer program product stored in the internal memory of a digital computer, containing parts of software code to execute the new and inventive method in accordance with claims 1-7 is likewise regarded as new and inventive according to Article 33(2) and 33(3) PCT.

N E W C L A I M S

1. Method for automatically transforming a provider offering describing a customer specific service environment in business terms into a form which is automatically executable by a resource management system, the method comprises the steps of:

receiving a description of a provider offering in business terms without any references to specific resources,

providing access to a resource catalog containing descriptions of all available resource types including information about dependencies of said resource types belonging to said customer specific service environment as well as reference information to execute resource management actions for said resource types,

mapping said description of said provider offering with said resource type information contained in said resource catalog and generating a customer specific service environment topology tree comprising the steps of:

using said provider offering as root node of a customer specific service environment topology tree to be generated,

adding identified resource types as nodes in said topology tree which are mapping with said provider offering,

adding child nodes to said identified nodes when said identified resource types (aggregated resource types) map into a set of lower level resource types (child resources),

repeating the previous steps until said resource types cannot be mapped into set of lower resource types (base resource types),

providing access to a resource management action catalog containing resource management actions each describing how to manage a single resource type by a resource control system,

traversing said customer specific service environment topology tree, wherein each node in said customer specific service environment topology tree represents a resource type,

extracting from said resource management action catalog all resource management actions of said resource types identified in said customer specific service environment resource topology tree,

sequencing said extracted resource management actions according to requirements of said defined customer specific service environment, and

compiling said sequenced management actions into a machine readable form executable by said resource management system.

2. Method according to claim 1, wherein said resource management actions includes the operations creation, management and/or deletion of said resource types.

3. Method according to claim 1, wherein said sequence is defined by input and out parameter of said resource management actions.

4. Method according to claim 1, wherein said sequence is implemented as workflow executable by said resource management system.

5. Method according to claim 1, wherein said resource management actions are used to define a decision logic in form

of rules to control the execution of said resource management actions.

6. Method according to claim 5, wherein said defined work flow process or said decision logic is implemented in a form of XML data.

7. Method according to 1, wherein said reference information includes a URL pointing to a Web Service with the corresponding Web Service description for execution of said resource management actions.

8. System for transforming a provider offering (110) describing a customer specific service environment in business terms into a form executable by a resource management system (132), comprising:

a transformation component (115) for generating a customer specific service environment topology tree by:

receiving a description of a provider offering in business terms without any references to specific resources,

providing access to a resource catalog (112) containing descriptions of all available resource types including information about dependencies of said resource types belonging to said customer specific service environment as well as reference information to execute resource management actions for said resource types,

mapping said description of said provider offering with said resource type information contained in said resource catalog and generating a customer specific service environment topology tree (120) by:

using said provider offering as root node of a customer specific service environment topology tree to be generated,

adding identified resource types as nodes in said topology tree which are mapping with said provider offering,

adding child nodes to said identified nodes when said identified resource types (aggregated resource types) map into a set of lower level resource types (child resources), and

repeating the previous steps until said resource types cannot be mapped into set of lower resource types (base resource types);

a compilation component (125) for generating a customer specific service environment definition (130) by:

providing access to a resource management action catalog (122) containing resource management actions each describing how to manage a single resource type by a resource control system,

traversing said customer specific service environment topology tree (120), wherein each node in said customer specific service environment topology tree represents a resource type,

extracting from said resource management action catalog (122) resource management actions of said resource types identified in said customer specific service environment resource topology tree,

sequencing said extracted resource management actions according to requirements of said defined customer specific service environment, and

compiling said sequenced resource management actions into a machine readable form executable by said resource management system (132).

9. System according to claim 8, wherein said resource catalog (112) contains categorized aggregated resource types which contain references to one or more other resources types with other parameters for them or a certain combination of them or both.

10. System according to claim 8, wherein said provider offering (110) forms the highest aggregation level of aggregated resource types and the base resources form the lowest not further expandable level in said resource catalog, wherein only said base resource types contain reference information to execute resource management actions for said resource types.

11. System according to claim 8, wherein said resource catalog (112) may be implemented in a form of a table stored in a database, or XML file stored in a file system.

12. System according to claim 8, wherein said resource management actions includes creation, management, and deletion of said resource types.

13. System according to claim 8, wherein each resource management action is defined by the name of the resource type, its task and its specific input and output parameter.

14. System according to claim 8, wherein the result of said compilation component (125) is a machine-readable description of sequenced resource management actions as well as decision logic for operating said customer specific service environment.

31-08-2005

22 August 2005

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15. Computer program product stored in the internal memory of a digital computer, containing parts of software code to execute the method in accordance with claim 1-7 if the product is run on the computer.